

## Book Review

## Book Review

The Law of Fracking by  
James T. O'Reilly

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*The Law of Fracking* by James T. O'Reilly (2016) is a comprehensive guide to United States regulations governing the use of hydraulic fracturing to extract shale gas. The book's structure makes it a useful reference for a reader interested in understanding the American legal framework, and to this end, it serves as a useful comparative work for those working in other jurisdictions. As the debate on this developing technology will arguably expand to other countries and perhaps even intensify in response to different countries' particular policies and issues, the USA's experience provides a good source of data and information for other countries as they move forward. As O'Reilly covers major legal issues and cases in fracking, it serves as a good resource for those both within and outside the USA, and can arguably aid in the development of regulation and policy in this field. Written by a Professor of Law and Public Health, who was vice-mayor of a small Ohio city in 2011, the text provides years of complex research in a short and accessible volume.

The twenty chapters, with further subdivisions, are listed in a detailed table of contents. Appendices provide helpful supplementary information, including a listing of the chemicals most commonly contained in fracking fluids; an overview of the technological advances since the inception of fracking; and future projections for natural gas production growth in the USA. Also included are a table of Laws and Rules, a table of Cases, and a detailed index. O'Reilly takes a scientific approach, using peer-reviewed and referenced citations, and uses this information to explain and analyze the legal issues he covers.

The author begins by explaining how to approach the study of fracking within the framework of a natural gas "legacy". First, he says it is important to learn the definitions and processes of the shale gas lifecycle, and, secondly, to then "recognize that all the venality and corruption that movies and television portray in the energy field is not generally true" (p. 2), but rather – although there has been "wealth gained from unethical competitive practices" (p. 2) – many engaged in the fracking industry want to leave a positive legacy. And thirdly, he acknowledges that the "legacy" of land and water pollution resulting from

fracking raises the problem of restoration, or, to speak in terms of liability, raises the question of who will pay for the cleanup if the site has been abandoned and the operating firm has been dissolved (p. 3).

The second chapter discusses the technical elements of shale gas extraction, including definitions and explanation of the stages of site and well preparation. The chapter also discusses the rapid development of the technology since the 1990's, and argues that with the abundance of shale oil in the United States, "the deliberation over fracking will likely continue for years to come" (p. 8). In addition, O'Reilly discusses the use of chemicals in the fracking fluid (a comprehensive list of most common chemicals is included in Appendix 3) and the quantities of water required in the process. The chapter concludes by examining the role of fine silica in propping open fractures in the shale; disposal of liquids and drilling wastes; and the impacts on health from fracking waste processes. O'Reilly explains that although there are current studies<sup>1</sup> that tie fracking to harm of human health, "there is not currently literature proving the certainty of a causal link" (14), yet there are studies<sup>2</sup> which *anticipate* impacts on health from fracking.

The third chapter deals with acquiring land rights to subsurface gas, and the differences between "surface" rights and "mineral" rights. Although surface and mineral rights are typically obtained together in "title to property" (p. 17), the rights to mineral resources may be held in a specific clause.<sup>3</sup> Many hydrocarbon leases "contain a 'Mother Hubbard' clause<sup>4</sup> to 'catch' property not adequately described in the lease," such as if the owner acquires further land through adverse means or if there are unknowns or gaps in the surveying of the property<sup>5</sup> (pp. 21–22). Other legal concepts examined in the chapter include firm's solicitation of permission to drill (through pressures

\* Imperial College London, UK.

<sup>1</sup> T. Colburn, "An Exploratory Study of Air Quality Near Natural Gas Operations," *Human and ecological risk assessment* 20 (1) (2014): 1–23.

<sup>2</sup> L. M. McKenzie, R. Z. Witter, L. S. Newman, and J. L. Adgate, "Human health risk assessment of air emissions from development of unconventional natural gas resources," *Science of the Total Environment* 424 (1) (2012): 79–87, doi: 10.1016/j.scitotenv.2012.02.018.

<sup>3</sup> E.g. "Reservation of Rights: Seller Maintains Mineral Rights in Blackacre" (p. 17).

<sup>4</sup> E.g. "This lease also covers and includes any and all lands owned or claimed by the Lessor adjacent or contiguous to the land described hereinabove, whether the same be in said survey or surveys or in adjacent surveys, although not included within the boundaries of the land described above". John S. Lowe, *Oil and Gas Law in a Nutshell* 45 (6th edn. 2014), at 191.

<sup>5</sup> Howard R. Williams and Charles J. Meyers, *Williams & Meyers Oil and Gas Law* 202.2 (Patrick H. Martin and Bruce M. Kramer, 5th edn. Authors 2013), at 221.

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to incentivize landowners to part with their mineral rights); issues of multiple landowners; and the idea of long-distance, lateral drilling – horizontal drilling – to reach below neighbor’s lands to acquire minerals, and can lead to disputes over ownership of resources.<sup>6</sup> The use of hydraulic fracturing combined with horizontal drilling may present an important legal issue “when the fluids or proppants traverse the boundary line into non-leased property” or if fractures cause leaks of “a non-lessor’s gas”<sup>7</sup> (p. 27). O’Reilly says that case law regarding issues of the application of the “rule of capture”<sup>8</sup> are beginning to develop but there are still key issues that remain to be settled.<sup>9</sup> The chapter also examines key issues such as conflicts between property owners and fracking operators, as well as the complex issue of wetlands and other federally protected areas.

Next, O’Reilly examines the terms of gas property leases, such as through a “Land Man” (the “middle man” responsible for purchasing land rights from property owners for companies) or gas firm’s agent. Another potential issue discussed is “forced pooling”: If a landowner refuses to lease mineral or land rights, many states have mechanisms for “forcing the mandatory “unitization”<sup>10</sup> or “pooling” of that drilling area” (p. 42).<sup>11</sup> Ultimately, pooled compensation is less than the initial offers, so after losing “exclusive possession” of their land, the owner will likely get lower gas royalties “but will bear large share of any state mandated cleanup costs”<sup>12</sup> (p. 43).<sup>13</sup>

Chapter 5 provides an overview of the participants in the fracking process. The chapter first follows the money, as “borrowed capital funding is the lifeblood” of fracking (p. 47). O’Reilly explains that national governmental bodies such as France’s Total SA or Norway’s Statoil have been some of the biggest investors in funding shale gas extraction in the U.S., but that they operate through intermediary LLCs, or Limited Liability Companies (p. 47).<sup>14</sup> Furthermore, he argues that the costs involved in hydraulic fracturing would have been an “unsurmountable barrier to the development . . . if it were not for the creative lenders and astute architects of financial arrangements” (p. 48). The next key participants the chapter follows are the drillers, or engineers and operators, as well as the “wide spectrum” of suppliers. O’Reilly describes how every single well is an intricate process with many supply chains and millions of dollars spent on necessary equipment and supplies. For example, the vast quantities of fine-grained sand needed to prop open fractures in the shale rock to release trapped gas has been a large source of wealth accumulation for silica suppliers in distant excavation regions such as Minnesota and Wisconsin (p. 49). The chapter also examines the importance of “following” the owners of surface land, in addition to the neighbors, as “litigation against the environmental effects of natural gas fracking is likely” (p. 51) to be brought by neighbors who do not stand to gain from the operations, yet suffer the negative consequences. For example, O’Reilly says that “opposi-

tion to fracking in public polling rose to 51% from 40% in 2015”<sup>15</sup> (p. 51).

The lifecycle stages of the operation are examined next (Chapter 6). O’Reilly discusses exploratory planning, investment and insurance issues, the stages of negotiation of land leases, and applications for state permits. Importantly, the chapter also defines and distinguishes between horizontal and vertical drilling, and explains the process of “completion” of the well after drilling, once the curved drilling phase has been completed and the process of extracting mud containing methane gas may begin (p. 61). Other stages explained include the processes of fracturing the shale, flooding the rock to cause the mixture containing gas to rise to the surface, and the process of separating the gas from the mud mixture. Additionally, it is possible to “re-stimulate” the shale rock to extract additional gas, yet ultimately the “site will be closed down” when the process is no longer worth the operational costs (p. 65). The final stage discussed is the injection of waste liquids, where O’Reilly reasons issues of fracking waste involve more “political science” than geology because “industry’s excellent lobbying record inside state legislatures has made the gas waste disposal an invisible issue which local government cannot control”<sup>16</sup> (p. 67).<sup>17</sup>

<sup>6</sup> *e.g.* Dart Cherokee Basin Operating Co., LLC v. Owens, 135 S. Ct. 547, 190 L. Ed. 2s 495 (2014).

<sup>7</sup> Barber v Magnum Land Services, LLC, 2014 U.S. Dist. LEXIS 146148 \*17–18, 2014 WL 5148575 (N.D. W. Va. 2014).

<sup>8</sup> Providing the capturer of oil and gas land has legal permission to construct the well, they are immune to claims of ownership made by owners of neighbouring lands. See Howard R. Williams and Charles J. Meyers, *Williams & Meyers Oil and Gas Law* 202.2 (Patrick H. Martin and Bruce M. Kramer, 5th edn. Authors 2013).

<sup>9</sup> *E.g.* Barber v. Magnum Land Services LLC, 2014 U.S. Dist. LEXIS 146148 \*17–18, 2014 WL 5148575 (N.D. W. Va. 2014)., also *Coastal Oil & Gas v. Garza*.

<sup>10</sup> Legally requiring property owners to allow private oil and gas extraction from their land

<sup>11</sup> *E.g.* *EQT Production Co. v. Opatkiewicz*. Case Np. GD-13-013489 (Pa. Com. Pleas. Ct., Alleghany County 2014).

<sup>12</sup> O’Reilly, “Free to be Fracked: The Curious Constitutional Consequences of Ohio Gas Law”, 41 *Cap. L. Rev.* 675 (2013).

<sup>13</sup> See O’Reilly, “Free to be Fracked: The Curious Constitutional Consequences of Ohio Gas Law”, 41 *Cap. L. Rev.* 675 (2013).

<sup>14</sup> Natural Resources Defense Council, *Fracking’s Most Wanted: Lifting the Veil on Oil and Gas Company Spills and Violations* (2015).

<sup>15</sup> Art Swift, Opposition to Fracking Mounts in the U.S., Gallup Poll, [opposition-fracking-mounts.aspx](http://www.gallup.com).

<sup>16</sup> See Ohio Rev. Code Ann. 1509.02, which was amended in 2010 to prevent waste controls by local government.

<sup>17</sup> See also James O’Reilly, *Superfund & Brownfields Cleanup* (West 3d ed. 2015).

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O'Reilly considers impacts on labor (Chapter 7) and discusses the question of “does fracking expand local jobs?” (p. 69). O'Reilly contends that the answer is complicated: the billions of dollars of capital supporting the drilling industry means that “the set of local employers will be changing quite rapidly” as local employment in agriculture is displaced by service jobs, and new drilling firms hire temporary workers (p. 69). However, “when the fracking boom suddenly ends in the notorious energy price-related cycles”, the local jobs supporting the fracking industry also suddenly end as the drilling moves on to a different area, meaning that the work in the industry is short term (pp. 70–71).<sup>18</sup> The chapter also examines legal issues related to potential conflicts between workers and employers and issues of worker compensation. O'Reilly explains that “drilling is a dangerous occupation”, with “injury rates seven times higher than the U.S. average”<sup>19</sup> (p. 75). Studies show that the high risk of occupational injury<sup>20</sup> in the fracking industry extends beyond the drilling stages, as there are also risks to the workers involved in the transportation and supplying stages (pp. 74–75).<sup>21</sup> Further complicating these issues are the difficulties in responding to safety issues or deaths, as the workers tend to be transient and witnesses to accidents are often not available for longer periods of investigation, in addition the limited number of field inspectors from state or national safety agencies (p. 75).

Chapter 8 addresses well waste outflows, including issues of separating mud into liquids and gas that can be sold, which often means that separated gases not being collected can be “flared off” (p. 83); as well as issues of “containment” ponds and tanks used to hold “waste liquids” carried to the surface during fracking operations (p. 85), which have occasionally, leaked or broken allowing waste liquids to percolate into the subsurface.<sup>22</sup> Chapter 9 delves into waste injection more in depth, explaining that “the disposal of waste liquids and sludges ... has been described as the ‘ticking time bomb’ of a very hurried industry” (p. 91), arguably a “signal of future remedial needs for a very rapidly evolving gas industry” (p. 91). The chapter covers relevant USA laws governing disposal of waste, such as the 1976 Resource Conservation & Recovery Act.<sup>23</sup> O'Reilly discusses arguably important industry exemptions to the U.S. EPA Underground Injection Control program, through what has been dubbed the “Halliburton Loophole”,<sup>24</sup> an amendment to the 2005 Energy Policy Act.<sup>25</sup> He explains that the “2005 Energy Policy Act amendments would seem to have wiped away the protection of federal requirements for those persons exposed to injection well problems in many states” (p. 93). Furthermore, exemptions to the key law governing waste disposal in the U.S., the 1976 Resource Conservation & Recovery Act<sup>26</sup> have enabled the “industry to avoid spending funds for the costs of actual neutralization and treatment of fracking wastes, so that the waste stream is addressed

simply by burying the waste in disposal wells” (p. 93).<sup>27</sup> O'Reilly next explains the cycle of waste generation and treatment, and discusses risks associated with disposal of radioactive waste solids; spill and fire; risks seismic activity from waste injection; and air pollution and emissions from both methane and diesel.

Chapter 10 deals with the arguably contentious issues of secrecy and disclosure of chemicals used in fracking. O'Reilly explains that “the gas driller will typically refuse to disclose what chemicals are used, on the claim that disclosure of the mixture would instruct other drillers on how to use a similar combination in a similar shale bed” (p. 112). He adds that “one’s perspective on the value of secrecy matters greatly” (p. 113): from an industry point of view, there is a defensible claim and arguably a significant legal issue in protecting the “trade secret” mix of chemicals, yet this perspective is in contrast to that of a neighbor, one who drinks the water in the area, or someone likely to be exposed to chemicals (p. 113). O'Reilly also discusses the role of the industry website FracFocus.org, but explains that although the site lists all chemicals “used somewhere in fracking some wells” (p. 117), the disclosure is not specific. He uses the analogy of the index pages of a cookbook that lists the multiple ingredients used in recipes throughout the book (p. 117). The comprehensive chapter also examines the scientific literature and case for why “disclosure issues matter” (p. 121), and provides an overview of research on the health impacts of arguably endocrine-disrupting and carcinogenic chemicals used, as well as issues of contamination from accidental spills. He further adds that “nondisclosure agreements result in the shielding of information necessary for the complete understanding of fracking’s health impacts” (p. 125). He argues

<sup>18</sup> See Frank Mauro *et al.*, “Exaggerating the Employment Impacts of Shale Drilling: How and Why,” Multi-State Shale Research Collaborative (October 2013).

<sup>19</sup> Federal NIOSH fracking site [www.dcd.gov/niosh/programs/oilgas/risks.html](http://www.dcd.gov/niosh/programs/oilgas/risks.html).

<sup>20</sup> OSHA Pamphlet, *Hydraulic Fracturing and Flowback Hazards other than Respirable Silica* (Dept of Labor Pub. No. OSHA 3763-12 (2014).

<sup>21</sup> E.g. *Kolln v. Rail Barge Truck Services Inc.*, 2015 WL 225050 (W.D. Okla. 2015).

<sup>22</sup> *Kartch v. EOG Resources, Inc.*, 845 F. Supp. 2d 995 (D.N.D. 2012).

<sup>23</sup> 42 U.S.C.A. 6901, see James O'Reilly, *RCRA & Superfund Practice Guide* (West 2015).

<sup>24</sup> See Michael Abramowitz and Steven Mufson, “Papers Detail Industry’s Role in Cheney Task Force”, Washington Post (July 18, 2007), [http://www.washingtonpost.com/wp-dyn/content/article/2007/07/17/AR2007071701987\\_of.html](http://www.washingtonpost.com/wp-dyn/content/article/2007/07/17/AR2007071701987_of.html).

<sup>25</sup> 2005 National Energy Policy Act, Pub. L. 109–58.

<sup>26</sup> 42 U.S.C.A. 6901, see James O'Reilly, *RCRA & Superfund Practice Guide* (West 2015).

<sup>27</sup> 40 C.F.R. 144.86.

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that public disclosure that clearly “explains the nature and known effect of fracking chemicals ... enables citizens to accurately judge their own risk” and that transparent reporting is “critical for residents to assess property damage and liability” from fracking activities (p. 127).

The following chapter (11) deals with the transportation issues, including trucks that supply the wells, trucks that move waste liquids and solids to landfills and rail and barge shipment of wastes. He discusses the key USA regulatory bodies including the Federal Energy Regulatory Commission (FERC, which controls pipelines), the Occupational Safety & Health Administration (OSHA), and the Federal Railroad Administration, or the FRA, which can use “pre-emptive force to block a state or local safety requirement, at the behest of the rail carriers”<sup>28</sup> (p. 139). Chapter 12 describes the role of gas pipelines and their regulation, where engineers see pipelines as “an indispensable part of gas extraction” and investors view them as “route to a payoff for their investment in extraction well infrastructure” (p. 145). O’Reilly goes through the different roles of the three separate regulators governing natural gas pipelines, the Federal Energy Regulatory Commission (FERC); the “state energy or public service oversight bodies” that control local operations; and the national Department of Transportation’s Pipeline and Hazardous Materials Safety Administration (PHMSA) (p. 146). O’Reilly also discusses safety issues, adding that although “‘out of sight, out of mind’ in most cases ... news cameras showing disastrous results are a reminder of how potent” the risks may be, and states that roughly a quarter of oil and gas pipelines – amounting to around 48,400 miles of subsurface piping – have been “constructed with an older and inferior type of welding that poses higher risks of breaking than modern pipes”<sup>29</sup> (p. 151).

Chapter 13 discusses the exports of natural gas, because although the text is focused on USA policy, “the realities of the energy market which have induced the rapid expansion of gas extraction are world-wide in scope” (p. 153). The chapter briefly overviews multilateral international treaties, such as the Global Agreement on Tariffs and Trade (GATT) and the World Trade Organization. The role of the “competing incentives” of different nations would arguably be an interesting subject for further research, particularly as fracking for natural gas is set to expand outside the USA. The chapter concludes with a brief discussion on obtaining export permits, and the role of policy uncertainties, including the “global climate change issues of converting power plants from coal to gas”, which situate fracking in an uncertain global context as the future of fossil fuels may arguably – out of necessity – diminish (p. 158).

The book’s fourteenth chapter deals with litigation regarding fracking wells and wastes. “Nuisance” is first defined. O’Reilly discusses how fracking opera-

tions can constitute nuisance (such as through noise pollution and congestion) as well as how drillers can defend claims and the damages that are permitted for claims. This chapter is particularly important in the United Kingdom context, as O’Reilly explores the common law concepts of “nuisance” and “negligence” (p. 160). He explains that the meaning of “nuisance” is variable, depending on both case law and state statutes. State definitions are equally ambiguous, using “vague terms like ‘injurious’” (p. 160). He explains that states generally “presume that a lawful enterprise will be conducted ‘so as not to constitute a nuisance’”<sup>30</sup> (p. 162), but that there are certain cases, for example in California, where “the manner in which the activity is performed may constitute a nuisance”<sup>31</sup> (p. 163). O’Reilly goes through previous cases, and discusses the damages allowed for nuisance claims which can include compensation for reduced property value, inconvenience, annoyance, or repairs costs<sup>32</sup> (p. 171). The author also discusses cases of negligence and spills; strict liability claims, whereby if plaintiffs can convince a court that “frack drilling activities are ‘abnormally dangerous’” (p. 175), they may be able to hold drillers to be “strictly liable” for any actual harm caused even if the operator arguably acts with “care” (p. 175). The second half of the chapter surveys how defendants may be “impacted by a plaintiff’s use of state nuisance precedents” (p. 179) by going through individual state laws on nuisance in California, Texas, Pennsylvania, West Virginia, Ohio, Colorado, Maryland, Oklahoma, North Dakota, and Kentucky.

Chapter 15 deals with potential remedies for restoration after fracking, explaining industries involved in extraction “use industrial processes to extract valuable minerals, and then move on to other places” (p. 189), and for residents of the area, the long-term critical issue is what restoration and remediation of land will follow the shale gas fracking and extraction “boom” (p. 189). O’Reilly mentions an extensive study published in *Science* in 2015 that “not much is known about to what extent oil and gas areas in the USA are being reclaimed, after they’ve been developed, and not much work is being done at the federal or state level to regulate or enforce this reclamation”<sup>33</sup> (p. 190). Furthermore, a peer-reviewed study by Duke University found that in 2016 in North

<sup>28</sup> *Norfolk Southern Ry. Co. v. Shanklin*, 529 U.S. 344, 12 S. Ct. 1467, 146 L. Ed. 2d 374 (2000).

<sup>29</sup> Elizabeth Douglass, “Anniversary of Exxon Spill”, *Inside Climate News* (April 3, 2015).

<sup>30</sup> 66 C.J.S. Nuisances 127.

<sup>31</sup> E.g., *Bright v. East Side Mosquito Abatement Dist.*, 168 Cal. App. 2d 7, 335 P.2d 527 (3d Dist. 1959).

<sup>32</sup> *Banford v. Aldrich Chem. Co., Inc.*, 126 Ohio St. 3d 210, 2010-Ohio-2470, 932 N.E. 2d 313, 317 (2010).

<sup>33</sup> B. W. Allred *et al.*, “Ecosystem services lost to oil and gas in North America”, *Science* 348, 401-402 (2015).

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Dakota, “thousands of saltwater and frack flowback spills throughout the oil patch have left a legacy of toxic contamination, including radioactive soils and polluted streams unsafe for human consumption and aquatic health”<sup>34</sup> (p. 191). The chapter also discusses the policy debate over costs of remediation, as fracking’s “long term environmental effects from the many sites of extraction are estimated to cost billions to remediate” but the estimates vary as each site and its water conditions are different (p. 195). In addition the complex issue of when the people behind a driller LLC can be held liable is considered. O’Reilly concludes that “the development of future case law will be very interesting to watch” (p. 206).

In the next two chapters, O’Reilly considers business aspects of fracking. In Chapter 16, he discusses financial issues and royalties. O’Reilly explains that shale gas “moves very rapidly to be removed to a pipeline, used productively, or to dissipate” (p. 207), and typically, shale gas wells decline in gas output by around 50–70 per cent in the first two years after commencing of fracking operations<sup>35</sup> (p. 207). Because of this, there is a demonstrated “need for speed and sustaining efforts” in shale gas development (p. 207). Further complex issues discussed are controversies over royalties, including North Dakota class action lawsuits brought by gas lessors attempting to show that “flaring” or burning off of unneeded gas at the wellhead lost them profit (p. 209).

Chapter 17 looks at antitrust law and competitive aspects of shale gas drilling. O’Reilly argues that drilling has high capital costs, and the natural gas industry competes for capital in global markets, and often competition is “artificially constrained” (p. 211). The chapter provides a concise overview of antitrust law and illegal market controls through agreements between competing firms not to compete for certain opportunities for gas extraction. The chapter also explains concepts surrounding competitive pricing for services and equipment, as well as how antitrust law is applied. For example, if a landowner signing a lease with a driller accepts deduction of “post-production costs of the driller” from their royalties, and the deductions are found to be incorrect, the lessee may claim fraud, as was the case in for a claim in Pennsylvania that ended with an 11-million-dollar settlement in 2015<sup>36</sup> (p. 207) which involved charges of fraud and racketeering.

Next, O’Reilly discusses state and local regulatory control, including tax issues, regulatory permits issued by states, and local laws such as “zoning of dangerous industrial activity adjacent to schools, policing of truck weights on local bridges”, and noise abatement orders (p. 223). The chapter also includes an interesting discussion of local responses to earthquakes and injection wells, arguing that “sufficient geological and seismological evidence has been amassed to establish that the high pressure deep well injection of fracking

waste can stimulate natural forces to cause tremors up the level of significant earthquakes”<sup>37</sup> (p. 226). For example, in 2014 local authorities in Ohio stopped gas operations at Poland Township’s Hilcorp site due to five earthquakes of magnitude 2.1 to 3.0 occurring close to the wellpad<sup>38</sup> (p. 227). The chapter concludes with a discussion of the evolution of state policies as drilling methods have evolved, and an overview of the laws governing zoning disputes.

Chapter 19 looks at both international and national government issues, including congressional exemptions and exclusions, including exemptions of the oil and gas industry from the Safe Drinking Water Act on waste injections of gas fracking due to a clause in the 2005 Energy Policy act that held an exclusion for waste from gas drillers (p. 234). The chapter also deals with federal enforcement of fracking-related violations, such as “crimes involving the dumping of fracking waste into rivers and the sewer outflows” leading to rivers, that may be prosecuted either federally or locally (p. 235).

The book’s final chapter deals with issues regarding native and public lands, and explains that “permission to use [federal] land must come from the Bureau of Land Management (BLM) or another federal governmental entity”, (p. 239). In 2015, the BLM “adopted final rules which will govern fracking well development on federal and Indian tribal areas”<sup>39</sup> (p. 239). The chapter also discusses federal land fracking requirements, such as new ones in 2015 which require drillers to “submit detailed information about the proposed operation, including wellbore geology, the location of faults and fractures, the depths of all usable water<sup>40</sup> ...” (p. 241). Other subjects include economic issues, policy issues, the effects of the Bureau of Land Management’s rules on fracking companies” supply operations, and state parks and forest lands.

O’Reilly’s book is an important contribution to literature on the current USA laws and the legacy issues of regulating fracking. An updated version of

<sup>34</sup> Lauren Donovan, “Study indicates lingering saltwater contamination in oil patch”, *Bismarck (N.Dak.) Tribune* (May 2016) [http://bismarcktribune.com/news/state-and-regional/study-indicates-lingering-saltwater-contamination-in-oil-patch/article\\_d62aaa65-c9ff-5ddb-bb40-8e0893efd-de3.html](http://bismarcktribune.com/news/state-and-regional/study-indicates-lingering-saltwater-contamination-in-oil-patch/article_d62aaa65-c9ff-5ddb-bb40-8e0893efd-de3.html).

<sup>35</sup> U.S. Rep. Matt Cartwright, Press Statement (Nov. 19, 2014).

<sup>36</sup> Terrie Morgan Besecker, “Judge denies motion to dismiss racketeering suit against Chesapeake Energy”, *Scranton Times-Tribune* (April 3, 2015).

<sup>37</sup> [www.usgs.gov](http://www.usgs.gov).

<sup>38</sup> David Conti, “Fracking Earthquakes”, *Pittsburgh Tribune* (April 27, 2016) [triblive.com/business/headlines/10378512-74/fracking-earthquakes-gas](http://triblive.com/business/headlines/10378512-74/fracking-earthquakes-gas).

<sup>39</sup> 43 C.F.R. part 3160, 80 Fed. Reg. 16128 (Mar. 26, 2016).

<sup>40</sup> 80 Fed. Reg. 16129-30 (Mar. 26, 2016).

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the first edition, and thorough guide to the bewildering tangle of laws governing the technology, the book is arguably particularly valuable to UK and EU policy makers as they develop their own regulations. This work is specifically pertinent for academics, practitioners, students, and even the general public as the concepts and laws are clearly explained. Furthermore,

this book serves as an excellent resource for audiences in Europe, and especially in the United Kingdom as fracking is now set to proceed in the North of England, as it elucidates the complicated web of potential legal issues and disputes related to the entire fracking lifecycle.